



**BILLING CODE 3510-22-P**

**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**RIN 0648-XG627**

**Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Aldo's Seawall Replacement Project in Santa Cruz, California**

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Notice; proposed incidental harassment authorization; request for comments on proposed authorization and possible renewal.

**SUMMARY:** NMFS has received a request from the Santa Cruz Port District (Port District) for authorization to take marine mammals incidental to the Aldo's Seawall Replacement Project in Santa Cruz, California (CA). Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to take marine mammals incidental to the specified activities. NMFS is also requesting comments on a possible one-year renewal that could be issued under certain circumstances and if all requirements are met, as described in *Request for Public Comments* at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

**DATES:** Comments and information must be received no later than *[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]*.

**ADDRESSES:** Comments should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service.

Physical comments should be sent to 1315 East-West Highway, Silver Spring, MD 20910 and electronic comments should be sent to *ITP.Fowler@noaa.gov*.

*Instructions:* NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments received electronically, including all attachments, must not exceed a 25-megabyte file size. Attachments to electronic comments will be accepted in Microsoft Word or Excel or Adobe PDF file formats only. All comments received are a part of the public record and will generally be posted online at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities> without change. All personal identifying information (e.g., name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

**FOR FURTHER INFORMATION CONTACT:** Amy Fowler, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at:

<https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities>. In case of problems accessing these documents, please call the contact listed above.

## **SUPPLEMENTARY INFORMATION:**

### **Background**

The MMPA prohibits the “take” of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce

(as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other “means of effecting the least practicable [adverse] impact” on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stocks for taking for certain subsistence uses (referred to in shorthand as “mitigation”); and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

### **National Environmental Policy Act**

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an incidental harassment authorization) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (incidental harassment authorizations with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment

and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the issuance of the proposed IHA qualifies to be categorically excluded from further NEPA review.

We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA request.

### **Summary of Request**

On August 27, 2018, NMFS received a request from the Port District for an IHA to take marine mammals incidental to the Aldo's Seawall Replacement Project in the Santa Cruz Small Craft Harbor (harbor). The application was deemed adequate and complete on March 21, 2019. The Port District's request is for take of four species of marine mammals by Level B harassment and Level A harassment. Neither the Port District nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

### **Description of Proposed Activity**

#### *Overview*

The Port District is planning to replace the existing seawall located below Aldo's Restaurant along the southwest bank of the Santa Cruz Small Craft Harbor beginning in June 2019. The original seawall was constructed between 1963 and 1964 and has deteriorated to the point that Aldo's Harbor Restaurant voluntarily closed in 2016. The proposed project involves demolishing the existing restaurant structure and timber pile supported restaurant deck, modifying a dock gangway landing, removing timber piles supporting the public wharf, removing and reinstalling rip-rap to accept the new sheet pile wall, predrilling for new sheet piles, and installing a new steel sheet pile seawall with concrete pile cap and tie-backs in front of the existing seawall. Removing old timber piles and installing new steel sheet piles has the

potential to harass marine mammals within the harbor and outside of the harbor in Monterey Bay.

#### *Dates and Duration*

Construction would occur between June 15 and November 1, 2019. Construction timing is restricted by salmonid migration to avoid and minimize potential impacts to steelhead trout (*Oncorhynchus mykiss*) that may occur in the harbor. Construction would occur only during daylight hours and during low tide, as feasible. The entire project is expected to take 18 weeks, with approximately 28 days of in-water work. Four timber piles would be removed over two days. Ninety sheet piles would be driven over 15 days at a rate of six piles per day. The remaining nine days of in-water work would involve pre-drilling to prepare the substrate for driving of sheet piles, and removing and reinstalling rip-rap around the seawall.

#### *Specific Geographic Region*

The harbor is located in Santa Cruz, California, off of Monterey Bay (see Figure 1 of the IHA application). The lower portion of the harbor runs primarily north-south while the upper portion (north of the Murray Street bridge) extends to the northeast (see Figures 2a and 2b in the IHA application). The harbor is less than 300 feet (ft) (91.4 meters (m)) wide at the mouth. The entrance to the harbor is marked by Walton Lighthouse, which sits atop a rock jetty extending into Monterey Bay. Aldo's Restaurant is located on the west side of the harbor. The harbor is entirely developed, consisting of docks, boat launches, a boat yard, and other facilities that provide harbor support services.

#### *Detailed Description of Specific Activity*

The existing Aldo's restaurant, concrete foundation, and timber pile supported deck will be removed. The existing timber piles supporting the deck will remain. All structure removal will

occur above the water and sound levels associated with the demolition are not likely to be significantly different from noise associated with regular harbor activities, such as large boat and vehicle traffic. Existing structure removal is not expected to result in take of marine mammals, and therefore will not be discussed further in this document.

On the south side of the restaurant, a portion of the existing rip-rap will be temporarily removed and stockpiled to prevent interference with installing the new seawall, and the remaining rip-rap will be protected in place. Approximately 300-400 square ft (91-122 square m) of rip-rap will be removed. This activity would occur at low tide and no equipment would enter the water. Following installation of the new seawall, the rip-rap that was previously removed and stockpiled would be reinstalled. Removal and subsequent replacement of rip-rap is not expected to result in take of marine mammals, and therefore will not be discussed further in this document.

On the north side of the restaurant, the gangway to AA-dock and a portion of the public wharf (see Figure 2a in the IHA application) would be temporarily removed to allow sheet pile installation. Following installation of the new seawall, the existing aluminum gangway to AA-dock would be reinstalled. The portion of the existing public wharf that was removed would be reframed and replaced in-kind. Modification of the gangway and public wharf are not expected to result in take, and therefore will not be discussed further in this document.

Four 16 inch (in) (40.6 centimeter (cm)) timber piles supporting the public wharf would be permanently removed. These piles would be removed using a vibratory driver to reduce the extraction effort and the likelihood that the pile would break. The piles would be removed using land-based equipment. No new timber piles would be installed.

The existing steel sheet pile wall, tie-rods, and concrete anchors would be abandoned in place. The new steel sheet pile wall would be installed on the water side of the existing seawall,

with rock placed in the void between the existing and new walls. The new seawall would extend approximately two feet further into harbor waters than the existing seawall. The new seawall will be composed of 90 0.5 m (1.6 ft) steel sheet piles, which will be driven in pairs.

Prior to installing the sheet piles, the contractor would pre-drill the substrate, drilling three 15 cm (6 in) diameter holes to the tip elevation for each pair of sheet piles. Pre-drilling would use land-based equipment, with only the auger in the water. Pre-drilling is expected to occur over five days but the actual duration of drilling activities is expected to be much shorter. NMFS has authorized take in association with certain types of drilling in other project (*e.g.*, 84 FR 4777; February 19, 2019), but those typically have much larger holes being drilled and/or other circumstances leading to an expectation of louder sound levels than are expected here. Because of the small drilled hole size and short duration of drilling, acoustic impacts from pre-drilling are not expected to rise to the level of a take, take is not proposed to be authorized here and the effects of pre-drilling will not be discussed further in this document.

The 90 sheet piles will be driven over approximately 15 days, at a rate of six piles per day. The contractor would first use a vibratory hammer to sink the sheet piles through the soil over the bedrock (sandstone). Once the sheet piles have been sunk into the substrate, the contractor would use an impact hammer to drive the sheet piles into the substrate to a maximum depth of embedment of 2 – 2.5 m (7 – 8 ft). Based on the varying density of the bedrock and the required depth of embedment, each sheet pile would require a maximum of 300 strikes (600 strikes per pair) from the impact hammer.

**Table 1. Summary of Pile Driving Activities.**

<b>Pile type</b>	<b>Method</b>	<b>Number of piles</b>	<b>Piles per day</b>	<b>Strikes per pile</b>	<b>Maximum daily duration</b>
16 in timber	Vibratory	4	2	N/A	6 hours

	removal				
0.5 m steel sheet	Vibratory installation	90	6	N/A	6 hours
0.5 m steel sheet	Impact installation	90	6	300	N/A

Proposed mitigation, monitoring, and reporting measures are described in detail later in this document (please see *Proposed Mitigation* and *Proposed Monitoring and Reporting*).

### **Description of Marine Mammals in the Area of Specified Activities**

Sections 3 and 4 of the IHA application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SAR; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS's website (<https://www.fisheries.noaa.gov/find-species>).

Table 2 lists all species with expected potential for occurrence in the harbor and surrounding waters of Monterey Bay and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2018). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.



Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. Pacific SARs. All values presented in Table 2 are the most recent available at the time of publication and are available in the 2017 SARs (Caretta *et al.*, 2018) and draft 2018 SARs (available online at:

<https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports>).

**Table 2. Marine Mammals with Potential Presence within the Proposed Project Area.**

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) <sup>1</sup>	Stock abundance (CV, N <sub>min</sub> , most recent abundance survey) <sup>2</sup>	PBR	Annual M/SI <sup>3</sup>
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Common bottlenose dolphin	<i>Tursiops truncatus</i>	California Coastal	- / -; N	453 (0.06, 346, 2011)	2.7	> 2.0
Family Phocoenidae (porpoises)						
Harbor porpoise	<i>Phocoena phocoena</i>	Monterey Bay	- / -; N	3,715 (0.51, 2,480, 2011)	25	0
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
California sea lion	<i>Zalophus californianus</i>	U.S.	- / -; N	257,606 (N/A, 233,515, 2014)	14,011	> 319
Family Phocidae (earless seals)						

Harbor seal	<i>Phoca vitulina</i>	California	- / -; N	30,968 (N/A, 27,348, 2012)	1,641	43
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1 - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

2 - NMFS marine mammal stock assessment reports online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable.

3 - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

All species that could potentially occur in the proposed project areas are included in Table 2. As described below, all four species (with four managed stocks) temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur, and we have proposed authorizing it. In addition, the southern sea otter (*Enhydra lutris nereis*) may be found in the harbor. However, southern sea otters are managed by the U.S. Fish and Wildlife Service and are not considered further in this document.

#### Harbor Seal

Harbor seals are residential year-round within the harbor, primarily utilizing harbor docks as nighttime haulout locations. The greatest numbers of hauled-out seals have been observed in the harbor at B, F, and FF docks, as well as the floating docks near the small boat launch (between docks F and FF) and the boat yard docks (T) (see Figures 2a and 2b in the IHA application). Most seals leave the harbor shortly after dawn, but some remain and forage within the harbor. The greatest concentrations of foraging seals are typically just south of the Murray

Street Bridge by the Live Bait dock (Dock S) (see Figure 2a in the IHA application). During the molting season, seals have been observed remaining at their nighttime haulouts several hours after dawn. Molting season in Santa Cruz is estimated to occur between late April and July (Seal Conservancy 2017; Vanderhoof and Allen 2005). During 2018 surveys, molting was observed from June through July 10. The harbor is not a known rookery for harbor seals; the closest known rookeries are Elkhorn Slough, Lover's Point State Marine Reserve, and Point Lobos (25-50 kilometers (km) (15.5-31 miles (mi)) south and southeast of the harbor).

#### California Sea Lion

Adult male California sea lions are resident in Monterey Bay outside of breeding season, and juvenile males are present in Monterey Bay year-round. California sea lions are visitors to the harbor, occasionally using the harbor for foraging and the docks and other harbor features for haulouts. Larger numbers of California sea lions may be present in the harbor waters when fish runs occur within the harbor. Weather, currents, seasonal upwelling conditions, and other oceanographic factors periodically bring anchovies, sardines, and other prey species into the harbor, drawing larger numbers of birds and pinnipeds. California sea lions are primarily observed using the docks of the lower harbor (south of the Murray Street bridge, see Figure 2a in the IHA application). The closest rookeries are Ano Nuevo Island (35 km (21.7 mi) northwest) and the Farallon Islands (120 km (74.6 mi) northwest) (Marine Mammal Center 2018; Wheeler 2001; Keith *et al.*, 1984).

#### Bottlenose Dolphin

A resident population of over 50 coastal bottlenose dolphins occurs in Monterey Bay (Hwang *et al.*, 2014). Sixty-eight uniquely marked individuals were observed during surveys in the early 1990s (Feinholz 1996). This population preferentially uses the northern part of

Monterey Bay but some of the photo-identified dolphins have been observed as far south as the Southern California Bight (Hwang *et al.*, 2014). Bottlenose dolphins are not known to occur within the harbor itself, but may be present in the nearshore waters immediately outside the mouth of the harbor.

#### Harbor Porpoise

Resident harbor porpoises are known to occur in the coastal waters of Monterey Bay. The bathymetry of the northern Monterey Bay results in a relatively high density of harbor porpoises in the nearshore areas (Jacobsen *et al.*, 2017; Jacobsen *et al.*, 2015). Porpoises in the northern part of Monterey Bay represent approximately 15 percent of the stock (Forney *et al.*, 2014). Harbor porpoises are the most common nearshore cetacean in Monterey Bay and although they have not been observed within the harbor, they have been observed outside the harbor (Forney pers. comm. 2018).

#### *Marine Mammal Hearing*

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans).

Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 dB threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. The functional groups and the associated frequencies are indicated below (note that these frequency ranges correspond to the range for the composite group, with the entire range not necessarily reflecting the capabilities of every species within that group):

- Low-frequency cetaceans (mysticetes): generalized hearing is estimated to occur between approximately 7 Hz and 35 kHz;
- Mid-frequency cetaceans (larger toothed whales, beaked whales, and most delphinids): generalized hearing is estimated to occur between approximately 150 Hz and 160 kHz;
- High-frequency cetaceans (porpoises, river dolphins, and members of the genera *Kogia* and *Cephalorhynchus*; including two members of the genus *Lagenorhynchus*, on the basis of recent echolocation data and genetic data): generalized hearing is estimated to occur between approximately 275 Hz and 160 kHz.
- Pinnipeds in water; Phocidae (true seals): generalized hearing is estimated to occur between approximately 50 Hz to 86 kHz;
- Pinnipeds in water; Otariidae (eared seals): generalized hearing is estimated to occur between 60 Hz and 39 kHz.

The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended

frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.*, 2006; Kastelein *et al.*, 2009; Reichmuth and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Four marine mammal species (two cetacean and two pinniped (one otariid and one phocid) species) have the reasonable potential to co-occur with the proposed survey activities. Please refer to Table 2. Of the cetacean species that may be present, one is classified as a mid-frequency cetacean (*i.e.*, all delphinid and ziphiid species and the sperm whale), and one is classified as a high-frequency cetacean (*i.e.*, harbor porpoise and *Kogia* spp.).

### **Potential Effects of Specified Activities on Marine Mammals and their Habitat**

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. The *Estimated Take* section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The *Negligible Impact Analysis and Determination* section considers the content of this section, the *Estimated Take* section, and the *Proposed Mitigation* section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

#### *Description of Sound Sources*

The marine soundscape is comprised of both ambient and anthropogenic sounds. Ambient sound is defined as the all-encompassing sound in a given place and is usually a composite of sound from many sources both near and far. The sound level of an area is defined by the total acoustical energy being generated by known and unknown sources. These sources

may include physical (*e.g.*, waves, wind, precipitation, earthquakes, ice, atmospheric sound), biological (*e.g.*, sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.*, vessels, dredging, aircraft, construction).

The sum of the various natural and anthropogenic sound sources at any given location and time – which comprise “ambient” or “background” sound – depends not only on the source levels (as determined by current weather conditions and levels of biological and shipping activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10-20 dB from day to day (Richardson *et al.* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

In-water construction activities associated with the project would include impact pile driving, vibratory pile driving, and vibratory pile removal. The sounds produced by these activities fall into one of two general sound types: impulsive and non-impulsive. Impulsive sounds (*e.g.*, explosions, gunshots, sonic booms, impact pile driving) are typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay (ANSI 1986; NIOSH 1998; ANSI 2005; NMFS 2018). Non-impulsive sounds (*e.g.*, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems) can be broadband, narrowband or tonal, brief or prolonged (continuous or intermittent), and typically do not have the high peak sound pressure with rapid rise/decay time

that impulsive sounds do (ANSI 1995; NIOSH 1998; NMFS 2018). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.*, Ward 1997 in Southall *et al.* 2007).

Two types of pile hammers would be used on this project: impact and vibratory. Impact hammers operate by repeatedly dropping a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak SPLs may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.* 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards 2002; Carlson *et al.* 2005).

The likely or possible impacts of the Port District's proposed activity on marine mammals could involve both non-acoustic and acoustic stressors. Potential non-acoustic stressors could result from the physical presence of the equipment and personnel; however, any impacts to marine mammals are expected to primarily be acoustic in nature. Acoustic stressors include effects of heavy equipment operation during pile installation and removal and drilling.

#### *Acoustic Impacts*

The introduction of anthropogenic noise into the aquatic environment from pile driving and removal is the primary means by which marine mammals may be harassed from the Port District's specified activity. In general, animals exposed to natural or anthropogenic sound may experience physical and psychological effects, ranging in magnitude from none to severe



(Southall *et al.* 2007). In general, exposure to pile driving and drilling noise has the potential to result in auditory threshold shifts and behavioral reactions (*e.g.*, avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior). Exposure to anthropogenic noise can also lead to non-observable physiological responses such as an increase in stress hormones. Additional noise in a marine mammal's habitat can mask acoustic cues used by marine mammals to carry out daily functions such as communication and predator and prey detection. The effects of pile driving and drilling noise on marine mammals are dependent on several factors, including, but not limited to, sound type (*e.g.*, impulsive vs. non-impulsive), the species, age and sex class (*e.g.*, adult male vs. mom with calf), duration of exposure, the distance between the pile and the animal, received levels, behavior at time of exposure, and previous history with exposure (Wartzok *et al.* 2004; Southall *et al.* 2007). Here we discuss physical auditory effects (threshold shifts) followed by behavioral effects and potential impacts on habitat.

NMFS defines a noise-induced threshold shift (TS) as a change, usually an increase, in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018). The amount of threshold shift is customarily expressed in dB. A TS can be permanent or temporary. As described in NMFS (2018), there are numerous factors to consider when examining the consequence of TS, including, but not limited to, the signal temporal pattern (*e.g.*, impulsive or non-impulsive), likelihood an individual would be exposed for a long enough duration or to a high enough level to induce a TS, the magnitude of the TS, time to recovery (seconds to minutes or hours to days), the frequency range of the exposure (*i.e.*, spectral content), the hearing and vocalization frequency range of the exposed species relative to the signal's frequency spectrum (*i.e.*, how

animal uses sound within the frequency band of the signal; *e.g.*, Kastelein *et al.* 2014), and the overlap between the animal and the source (*e.g.*, spatial, temporal, and spectral).

*Permanent Threshold Shift (PTS)* - NMFS defines PTS as a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018). Available data from humans and other terrestrial mammals indicate that a 40 dB threshold shift approximates PTS onset (see Ward *et al.* 1958, 1959; Ward 1960; Kryter *et al.* 1966; Miller 1974; Ahroon *et al.* 1996; Henderson *et al.* 2008). PTS levels for marine mammals are estimates, as with the exception of a single study unintentionally inducing PTS in a harbor seal (Kastak *et al.* 2008), there are no empirical data measuring PTS in marine mammals largely due to the fact that, for various ethical reasons, experiments involving anthropogenic noise exposure at levels inducing PTS are not typically pursued or authorized (NMFS 2018).

*Temporary Threshold Shift (TTS)* - A temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018). Based on data from cetacean TTS measurements (see Southall *et al.* 2007), a TTS of 6 dB is considered the minimum threshold shift clearly larger than any day-to-day or session-to-session variation in a subject's normal hearing ability (Schlundt *et al.* 2000; Finneran *et al.* 2000, 2002). As described in Finneran (2015), marine mammal studies have shown the amount of TTS increases with cumulative sound exposure level ( $SEL_{cum}$ ) in an accelerating fashion: At low exposures with lower  $SEL_{cum}$ , the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher higher  $SEL_{cum}$ , the growth curves become steeper and approach linear relationships with the noise SEL.

Depending on the degree (elevation of threshold in dB), duration (*i.e.*, recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when communication is critical for successful mother/calf interactions could have more serious impacts. We note that reduced hearing sensitivity as a simple function of aging has been observed in marine mammals, as well as humans and other taxa (Southall *et al.* 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin (*Tursiops truncatus*), beluga whale (*Delphinapterus leucas*), harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiiaeorientalis*)) and five species of pinnipeds exposed to a limited number of sound sources (*i.e.*, mostly tones and octave-band noise) in laboratory settings (Finneran 2015). TTS was not observed in trained spotted (*Phoca largha*) and ringed (*Pusa hispida*) seals exposed to impulsive noise at levels matching previous predictions of TTS onset (Reichmuth *et al.* 2016). In general, harbor seals and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean species (Finneran 2015). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species. No data are available on noise-induced hearing loss for mysticetes. For summaries of data on TTS in marine mammals or for further discussion of TTS onset thresholds, please see Southall *et al.* (2007), Finneran and

Jenkins (2012), Finneran (2015), and Table 5 in NMFS (2018). Installing piles requires a combination of impact pile driving and vibratory pile driving. For the project, these activities would not occur at the same time and there would likely be pauses in activities producing the sound during each day. Given these pauses and that many marine mammals are likely moving through the action area and not remaining for extended periods of time, the potential for TS declines.

*Behavioral Harassment* - Exposure to noise from pile driving and removal and drilling also has the potential to behaviorally disturb marine mammals. Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.*, Lusseau and Bejder 2007; Weilgart 2007; NRC 2005).

Disturbance may result in changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located. Pinnipeds may increase their haul out time, possibly to avoid in-water disturbance (Thorson and Reyff 2006). Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.*, species, state of maturity, experience, current activity, reproductive state, auditory

sensitivity, time of day), as well as the interplay between factors (*e.g.*, Richardson *et al.* 1995; Wartzok *et al.* 2003; Southall *et al.* 2007; Weilgart 2007; Archer *et al.* 2010). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.* 2012), and can vary depending on characteristics associated with the sound source (*e.g.*, whether it is moving or stationary, number of sources, distance from the source). In general, pinnipeds seem more tolerant of, or at least habituate more quickly to, potentially disturbing underwater sound than do cetaceans, and generally seem to be less responsive to exposure to industrial sound than most cetaceans. Please see Appendices B-C of Southall *et al.* (2007) for a review of studies involving marine mammal behavioral responses to sound.

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (*e.g.*, bubble nets or sediment plumes), or changes in dive behavior. As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.*, Croll *et al.* 2001; Nowacek *et al.* 2004; Madsen *et al.* 2006; Yazvenko *et al.* 2007). A determination of whether foraging disruptions incur fitness consequences would require information on or estimates of the energetic requirements of the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal.

In 2016, the Alaska Department of Transportation and Public Facilities (ADOT&PF) documented observations of marine mammals during construction activities (*i.e.*, pile driving and down-hole drilling) at the Kodiak Ferry Dock (see 80 FR 60636 for Final IHA **Federal Register**

notice). In the marine mammal monitoring report for that project (ABR 2016), 1,281 Steller sea lions were observed within the behavioral disturbance zone during pile driving or drilling (*i.e.*, documented as Level B harassment take). Of these, 19 individuals demonstrated an alert behavior, 7 were fleeing, and 19 swam away from the project site. All other animals (98 percent) were engaged in activities such as milling, foraging, or fighting and did not change their behavior. In addition, two sea lions approached within 20 meters of active vibratory pile driving activities. Three harbor seals were observed within the disturbance zone during pile driving activities; none of them displayed disturbance behaviors. Fifteen killer whales and three harbor porpoise were also observed within the Level B harassment zone during pile driving. The killer whales were travelling or milling while all harbor porpoises were travelling. No signs of disturbance were noted for either of these species. Given the similarities in activities and habitat and the fact the same species are involved, we expect similar behavioral responses of marine mammals to the specified activity. That is, disturbance, if any, is likely to be temporary and localized (*e.g.*, small area movements). Monitoring reports from other recent pile driving projects have observed similar behaviors.

*Masking* - Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.*, those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.* 1995). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.*, snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.*, pile driving, shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the

noise source and the signal of interest (*e.g.*, signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.*, sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions. Masking of natural sounds can result when human activities produce high levels of background sound at frequencies important to marine mammals. Conversely, if the background level of underwater sound is high (*e.g.* on a day with strong wind and high waves), an anthropogenic sound source would not be detectable as far away as would be possible under quieter conditions and would itself be masked. The harbor houses hundreds of small craft vessels that transit through the harbor waters on a regular basis; therefore, background sound levels in the harbor are already elevated.

*Airborne Acoustic Effects* - Pinnipeds that occur near the project site could be exposed to airborne sounds associated with pile driving and removal that have the potential to cause behavioral harassment, depending on their distance from pile driving activities. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA.

Airborne noise would primarily be an issue for pinnipeds that are swimming or hauled out near the project site within the range of noise levels exceeding the acoustic thresholds. We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when looking with their heads above water. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. For instance, anthropogenic sound could cause hauled-out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon the area and move further from the source. However, these animals would previously have been

‘taken’ because of exposure to underwater sound above the behavioral harassment thresholds, which are in all cases larger than those associated with airborne sound. Thus, the behavioral harassment of these animals is already accounted for in these estimates of potential take. Therefore, we do not believe that authorization of incidental take resulting from airborne sound for pinnipeds is warranted, and airborne sound is not discussed further here.

### *Marine Mammal Habitat Effects*

The Port District’s construction activities within the harbor could have localized, temporary impacts on marine mammal habitat by increasing in-water sound pressure levels and slightly decreasing water quality. Construction activities are of short duration and would likely have temporary impacts on marine mammal habitat through increases in underwater sound. Increased noise levels may affect acoustic habitat (see masking discussion above) and adversely affect marine mammal prey in the vicinity of the project area (see discussion below). During impact pile driving, elevated levels of underwater noise would ensonify the harbor where both fish and mammals may occur and could affect foraging success.

In-water pile driving and pile removal would also cause short-term effects on water quality due to increased turbidity. Local currents are anticipated to disburse suspended sediments produced by project activities at moderate to rapid rates depending on tidal stage. The Port District would employ standard construction best management practices, thereby reducing any impacts. Therefore, the impact from increased turbidity levels is expected to be discountable.

### *In-water Construction Effects on Potential Foraging Habitat*

The area likely impacted by the project is relatively small compared to the available habitat in Monterey Bay and does not include any BIAs or ESA-designated critical habitat. Foraging efforts within the harbor are minimal, and the narrow mouth of the harbor would



restrict sound transmission into Monterey Bay to a narrow band of sound in the southeastern direction. Pile installation/removal and drilling may temporarily increase turbidity resulting from suspended sediments. Any increases would be temporary, localized, and minimal. The Port District must comply with state water quality standards during these operations by limiting the extent of turbidity to the immediate project area. In general, turbidity associated with pile installation is localized to about a 25-foot radius around the pile (Everitt *et al.* 1980). Cetaceans are not expected to enter the harbor and be close enough to the project pile driving areas to experience effects of turbidity, and any pinnipeds would likely be transiting the area and could avoid localized areas of turbidity. Therefore, the impact from increased turbidity levels is expected to be discountable to marine mammals. Furthermore, pile driving and removal at the project site would not obstruct movements or migration of marine mammals.

Avoidance by potential prey (*i.e.*, fish) of the immediate area due to the temporary loss of this foraging habitat is also possible. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity in Monterey Bay.

The duration of the construction activities is relatively short, with pile driving and removal activities expected to take only 17 days. Each day, construction would occur for only a few hours during the day. Impacts to habitat and prey are expected to be temporary and minimal based on the short duration of activities.

#### *In-water Construction Effects on Potential Prey (Fish)*

Construction activities would produce continuous (*i.e.*, vibratory pile driving) and pulsed (*i.e.* impact driving) sounds. Fish react to sounds that are especially strong and/or intermittent

low-frequency sounds. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish, although several are based on studies in support of large, multiyear bridge construction projects (*e.g.*, Scholik and Yan 2001, 2002; Popper and Hastings 2009). Sound pulses at received levels of 160 dB may cause subtle changes in fish behavior. SPLs of 180 dB may cause noticeable changes in behavior (Pearson *et al.* 1992; Skalski *et al.* 1992). SPLs of sufficient strength have been known to cause injury to fish and fish mortality.

The most likely impact to fish from pile driving and drilling activities at the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. In general, impacts to marine mammal prey species are expected to be minor and temporary due to the short timeframe for the project.

Construction activities, in the form of increased turbidity, have the potential to adversely affect fish in the project area. Increased turbidity is expected to occur in the immediate vicinity (on the order of 10 feet or less) of construction activities. However, suspended sediments and particulates are expected to dissipate quickly within a single tidal cycle. Given the limited area affected and high tidal dilution rates any effects on fish are expected to be minor or negligible. In addition, best management practices would be in effect, which would limit the extent of turbidity to the immediate project area.

In summary, given the short daily duration of sound associated with individual pile driving and drilling events and the relatively small areas being affected, pile driving and drilling

activities associated with the proposed action are not likely to have a permanent, adverse effect on any fish habitat, or populations of fish species. Thus, we conclude that impacts of the specified activity are not likely to have more than short-term adverse effects on any prey habitat or populations of prey species. Further, any impacts to marine mammal habitat are not expected to result in significant or long-term consequences for individual marine mammals, or to contribute to adverse impacts on their populations.

### **Estimated Take**

This section provides an estimate of the number of incidental takes proposed for authorization through this IHA, which will inform both NMFS' consideration of "small numbers" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would primarily be by Level B harassment, as use of the vibratory and impact pile hammers has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily for high frequency cetaceans and phocids, because predicted auditory injury zones are larger than for mid-frequency species and otariids. However, due to the shape of the harbor and the small overall ensonified area (see Figure 3 in IHA application), auditory injury in high

frequency cetaceans is not expected nor proposed to be authorized. Auditory injury may occur in phocids within the inner harbor area. The proposed mitigation and monitoring measures are expected to minimize the severity of such taking to the extent practicable.

As described previously, no mortality is anticipated or proposed to be authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.*, previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimate.

#### *Acoustic Thresholds*

Using the best available science, NMFS has developed acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

*Level B Harassment for non-explosive sources* – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience,

demography, behavioral context) and can be difficult to predict (Southall *et al.*, 2007, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1  $\mu$ Pa (rms) for continuous (*e.g.*, vibratory pile-driving, drilling) and above 160 dB re 1  $\mu$ Pa (rms) for non-explosive intermittent (*e.g.*, impact pile driving) sources.

The Port District's proposed activity includes the use of continuous (vibratory pile driving and removal) and impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1  $\mu$ Pa (rms) thresholds are applicable.

*Level A harassment for non-explosive sources* - NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). The Port District's proposed activity includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving and removal) sources.

These thresholds are provided in the table below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance>.

**Table 3. Thresholds identifying the onset of Permanent Threshold Shift.**

	<b>PTS Onset Acoustic Thresholds*</b> (Received Level)	
<b>Hearing Group</b>	<b>Impulsive</b>	<b>Non-impulsive</b>
<b>Low-Frequency (LF) Cetaceans</b>	<i>Cell 1</i> $L_{pk,flat}$ : 219 dB $L_{E,LF,24h}$ : 183 dB	<i>Cell 2</i> $L_{E,LF,24h}$ : 199 dB
<b>Mid-Frequency (MF) Cetaceans</b>	<i>Cell 3</i> $L_{pk,flat}$ : 230 dB $L_{E,MF,24h}$ : 185 dB	<i>Cell 4</i> $L_{E,MF,24h}$ : 198 dB
<b>High-Frequency (HF) Cetaceans</b>	<i>Cell 5</i> $L_{pk,flat}$ : 202 dB $L_{E,HF,24h}$ : 155 dB	<i>Cell 6</i> $L_{E,HF,24h}$ : 173 dB
<b>Phocid Pinnipeds (PW) (Underwater)</b>	<i>Cell 7</i> $L_{pk,flat}$ : 218 dB $L_{E,PW,24h}$ : 185 dB	<i>Cell 8</i> $L_{E,PW,24h}$ : 201 dB
<b>Otariid Pinnipeds (OW) (Underwater)</b>	<i>Cell 9</i> $L_{pk,flat}$ : 232 dB $L_{E,OW,24h}$ : 203 dB	<i>Cell 10</i> $L_{E,OW,24h}$ : 219 dB
<p>* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.</p> <p><u>Note:</u> Peak sound pressure (<math>L_{pk}</math>) has a reference value of 1 <math>\mu</math>Pa, and cumulative sound exposure level (<math>L_E</math>) has a reference value of 1 <math>\mu</math>Pa<sup>2</sup>s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript “flat” is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.</p>		

*Ensonified Area*

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the proposed project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, impact pile driving, vibratory pile driving and removal). The entire lower harbor (see Figure 2a in the IHA application) and a small, narrow band extending southeast from the mouth of the harbor into Monterey Bay (see Figure 3 in the IHA application) may be ensonified by project activities. Vessel traffic within the harbor and out in Monterey Bay may contribute to elevated background noise levels which may mask sounds produced by the project.

The distances to the Level A and Level B harassment thresholds were calculated based on source levels from similar pile driving activities in California and Washington. The Port District utilized in-water measurements generated by the Greenbusch Group (2018) from the Seattle Pier 62 project (83 FR 39709) to establish proxy sound source levels for vibratory removal of the 16-inch timber piles. The results determined unweighted rms ranging from 140 dB to 169 dB. NMFS analyzed source measurements at different distances for all 63 individual timber piles that were removed at Pier 62 and normalized the values to 10 m. The results showed that the median is 152 dB SPLrms. This value was used as the source level for vibratory removal of 16-inch timber piles (Table 4). For vibratory and impact installation of steel sheet piles, the Port District utilized reference source levels of vibratory and impact driving of 24-inch (0.6 m) steel sheet piles from CalTrans *Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish* (Buehler *et al.*, 2015). Vibratory driving of 24-inch (0.6 m) AZ

steel sheet piles was found to have a range of source levels between 160 and 165 dB (rms) at 10 m, but the typical source level was 160 dB rms (Table 4). The proposed project involves slightly smaller 0.5 m steel sheet piles, but the CalTrans source levels are the best available proxy.

**Table 4. Source Levels for Pile Driving Activities.**

Activity	SPL <sub>PK</sub> (dB)	SPL <sub>RMS</sub> (dB)	SEL (dB)	Source
Vibratory timber pile removal	n/a	152	n/a	Greenbusch Group 2018
Vibratory sheet pile installation	175	160	160	Buehler <i>et al.</i> , 2015
Impact sheet pile installation	205	190	180	Buehler <i>et al.</i> , 2015

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$$TL = B * \text{Log}_{10} (R_1/R_2), \text{ where}$$

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading equals 15

$R_1$  = the distance of the modeled SPL from the driven pile, and

$R_2$  = the distance from the driven pile of the initial measurement

A practical spreading value of fifteen is often used under conditions, such as at the harbor, where water increases with depth as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions. Practical spreading loss is assumed here.

Using the practical spreading loss model, the Port District determined the distance where the noise will fall below the behavioral effects threshold for both continuous (vibratory pile



driving and removal) and intermittent (impact pile driving) sources (120 and 160 dB dB re 1  $\mu$ Pa (rms), respectively). These distances are shown in Table 6 below.

When the NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimate of Level A harassment take. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources (such as pile driving), NMFS User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would not incur PTS. Inputs used in the User Spreadsheet, and the resulting isopleths are reported below.

**Table 5. User spreadsheet input parameters used for calculating harassment isopleths.**

<b>Parameter</b>	<b>Impact Pile Driving</b>	<b>Vibratory Pile Driving (Sheet Pile)</b>	<b>Vibratory Pile Removal (Timber Pile)</b>
Spreadsheet Tab Used	E.1) Impact pile driving	A.1) Vibratory pile driving	A.1) Vibratory pile driving
Source Level	180 dB SEL	160 dB RMS	152 dB RMS
Weighting Factor Adjustment (kHz)	2	2.5	2.5
Number of strikes per pile	300	N/A	N/A
Number of piles per day	6	N/A	N/A

Activity Duration (hours) within 24-hour period	N/A	6	6
Propagation (xLogR)	15LogR	15LogR	15LogR
Distance of source level measurement (meters)	10	10	10

**Table 6. Calculated distances to Level A harassment and Level B harassment isopleths during pile installation and removal.**

Source	Level A Harassment Zone (meters)				Level B Harassment Zone (meters)
	Mid-frequency cetacean	High-frequency cetacean	Phocid pinniped	Otariid pinniped	
Impact pile driving	33	1111	499	36	1000
Vibratory pile driving (sheet pile)	2	29	12	1	4642
Vibratory pile removal (timber pile)	< 1	8	3	< 1	1359

While the calculated distances to the Level A and Level B harassment isopleths are up to 4,642 m, the project occurs within a nearly completely enclosed harbor, with only a narrow mouth leading out into the larger Monterey Bay. The harbor is approximately 152 m wide at the project site, and the furthest extent sound could travel in a straight line within the harbor is approximately 610 m (see Figures 2a and 2b in the IHA application). Depending on the pile location, sound may travel out the mouth of the harbor, but only in a small narrow band extending to the southeast (see Figure 3 in the IHA application). Therefore, while the calculated distances to thresholds are large, the actual ensonified area is significantly constrained by land.

#### *Marine Mammal Occurrence*

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations.

Harbor seals and California sea lions are regular occupants of the harbor. Monitors from EcoSystems West conducted surveys of harbor docks in May and June 2018 to determine the number of pinnipeds expected to occur during the project. As stated previously, harbor seals are known to use the harbor docks and other structures for nighttime haulouts. Most surveys occurred at dawn to count the number of pinnipeds that may be present at the beginning of each day of construction. Additional daytime monitoring occurred in July and August 2018 during harbor maintenance activities. These daytime surveys included counts of pinnipeds hauled out and in the water. The maximum number of hauled out harbor seals was 23 while up to three seals were observed in the water during the day. Up to four California sea lions were observed using the harbor during the day. Harbor porpoises and bottlenose dolphins do not typically occur within the harbor, but may transit through the narrow band of ensonified area that extends to the southeast of the harbor entrance (see Figure 3 in the IHA application).

#### *Take Calculation and Estimation*

Here we describe how the information provided above is brought together to produce a quantitative take estimate.

*Level B Harassment* – Level B takes of harbor seals and California sea lions were estimated by multiplying the highest number of animals observed within the harbor (23 harbor seals and four California sea lions) by the days of activity (17 days). Level B harassment take of harbor porpoises and bottlenose dolphins was estimated using mean group size and the likelihood that a group of animals may enter the ensonified area during the project. Mean group size of harbor porpoises traveling through northern Monterey Bay was assumed to be 1.75

animals (Forney *et al.*, 2014) and we assume that a group of porpoises may pass through the ensonified band every other day during construction (eight days total). Mean group size of bottlenose dolphins was assumed to be eight animals (Weller *et al.*, 2016) and we assume that a group of dolphins may pass through the ensonified band every other day during construction (eight days).

*Level A Harassment* – Level A harassment takes of harbor seals were estimated by multiplying the highest number of seals observed in the water during the day (three seals) by the number of days of impact pile driving (15 days). Level A harassment is only expected and proposed to be authorized for harbor seals during impact pile driving, due to the relatively small Level A harassment isopleths for other species and other activities. Mitigation measures (described in detail below) are expected to eliminate any potential for Level A harassment of California sea lions within the harbor. While the Level A harassment zone for harbor porpoises is greater than that of harbor seals, harbor porpoises are not expected to occur within the narrow band of sound that may exceed the harassment threshold for sufficient duration to experience Level A harassment (see Figures 1 and 3 in the IHA application). Take of harbor porpoises by Level A harassment has not been requested and is not proposed to be authorized.

**Table 7. Estimated take by Level A and Level B harassment, by species and stock, resulting from proposed Port District project activities.**

Species	Stock	Level B takes per day	Level A takes per day	Days of activity	Total Level B take	Total Level A take	Total proposed Take	Proposed take as percentage of stock
Harbor seal	California	23	3	17 <sup>a</sup>	391	45	436	1.41%
California sea lion	U.S.	4	0	17	68	0	68	0.03%
Bottlenose	California	8	0	8 <sup>b</sup>	64	0	64	14.1%

dolphin	Coastal							
Harbor porpoise	Monterey Bay	2	0	8 <sup>b</sup>	16	0	16	0.43%

<sup>a</sup> Days of activity for Level A take calculations is only 15 days of impact pile driving

<sup>b</sup> Harbor porpoises and bottlenose dolphins are expected to occur within the ensounded area every other day during construction activities

## Proposed Mitigation

In order to issue an IHA under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned) the likelihood of effective implementation (probability implemented as planned); and

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

### *Mitigation for Marine Mammals and their Habitat*

In addition to the measures described later in this section, the Port District will employ the following standard mitigation measures:

- Conduct briefings between construction supervisors and crews and the marine mammal monitoring team prior to the start of all pile driving activity, and when new personnel join the work, to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures;
- For in-water heavy machinery work other than pile driving (*e.g.*, pre-drilling, etc.), if a marine mammal comes within 10 m, operations shall cease and equipment use reduced to minimum level required to maintain safe working conditions. This type of work could include the following activities: (1) pre-drilling; or (2) positioning of the pile on the substrate via a land-based crane;
- Work may only occur during daylight hours, when visual monitoring of marine mammals can be conducted;
- For those marine mammals for which Level B harassment take has not been requested, in-water pile installation/removal and drilling will shut down immediately if such species are observed within or on a path towards the monitoring zone (*i.e.*, Level B harassment zone); and

- If take reaches the authorized limit for an authorized species, pile installation will be stopped as these species approach the Level B harassment zone to avoid additional take.

The following measures are also included in the mitigation requirements:

*Establishment of Shutdown Zone for Level A Harassment* – For all pile driving and removal activities, the Port District must establish a shutdown zone. The purpose of a shutdown zone is generally to define an area within which shutdown of an activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). During all pile driving activities, a minimum shutdown zone of 25 m would be enforced (Table 8). A 40 m shutdown zone would be used for California sea lions during impact pile driving to prevent Level A harassment exposure (Table 8). Harbor porpoises and bottlenose dolphins are not expected to occur within the harbor, so instead of a standard shutdown distance, the Port District will be required to shutdown impact pile driving activities if these species are observed entering the harbor (Table 8). A Protected Species Observer (PSO) will be stationed within the harbor such that they have a view of the immediate area around the pile driving as well as the areas north (toward the back of the harbor) and south (toward the harbor entrance) of the project site.

*Establishment of Monitoring Zones for Level B Harassment* – The calculated distances to the Level B harassment thresholds may exceed the distance within the harbor that sound may travel in a linear direction. The harbor is approximately 152 m wide at the project site, and the furthest extent sound could travel in a straight line within the harbor is approximately 610 m (see Figures 2a and 2b in the IHA application). Sound may transmit in a narrow band into Monterey Bay through the mouth of the harbor but the overall ensonified area is relatively small. As stated above, a PSO will be stationed within the harbor. Rather than a set distance-based monitoring zone, the PSOs will monitor the entire observable harbor area (Table 8).

**Table 8. Shutdown and monitoring zones by project activity.**

Activity	Shutdown Zone (m)	Monitoring Zone
Vibratory removal of timber piles	All species: 25	Entire observable harbor area
Impact installation of steel sheet piles	Harbor seal: 25 California sea lion: 40 Harbor porpoise and bottlenose dolphin: at mouth of harbor	
Vibratory installation of steel sheet piles	All species: 25	
All other in-water activities (e.g., pre-drilling)	10	

*Soft Start* - The use of soft-start procedures are believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, contractors would be required to provide an initial set of strikes from the hammer at reduced energy, with each strike followed by a 30-second waiting period. This procedure would be conducted a total of three times before impact pile driving begins. Soft start would be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of thirty minutes or longer. Soft start is not required during vibratory pile driving and removal activities.

*Pre-Activity Monitoring* - Prior to the start of daily in-water construction activity, or whenever a break in pile driving/removal or drilling of 30 minutes or longer occurs, PSOs will observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone will be cleared when a marine mammal has not been observed within the zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes. If the Level B



harassment zone has been observed for 30 minutes and non-permitted species are not present within the zone, soft start procedures can commence and work can continue even if visibility becomes impaired within the Level B monitoring zone. When a marine mammal permitted for Level B harassment take is present in the Level B harassment zone, activities may begin and Level B harassment take will be recorded. As stated above, if the entire Level B harassment zone is not visible at the start of construction, piling or drilling activities can begin. If work ceases for more than 30 minutes, the pre-activity monitoring of both the Level B harassment and shutdown zone will commence.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has preliminarily determined that the proposed mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

### **Proposed Monitoring and Reporting**

In order to issue an IHA for an activity, Section 101(a)(5)(D) of the MMPA states that NMFS must set forth, "requirements pertaining to the monitoring and reporting of such taking." The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and
- Mitigation and monitoring effectiveness.

#### *Marine Mammal Visual Monitoring*

Monitoring shall be conducted by NMFS-approved observers. A trained observer shall be placed from the best vantage point(s) practicable to monitor for marine mammals and implement shutdown or delay procedures when applicable through communication with the equipment operator. Observer training must be provided prior to project start, and shall include instruction on species identification (sufficient to distinguish the species in the project area), description and

categorization of observed behaviors and interpretation of behaviors that may be construed as being reactions to the specified activity, proper completion of data forms, and other basic components of biological monitoring, including tracking of observed animals or groups of animals such that repeat sound exposures may be attributed to individuals (to the extent possible).

Monitoring would be conducted 30 minutes before, during, and 30 minutes after pile driving/removal and drilling activities. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven or removed. Pile driving/removal and drilling activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.

One PSO would be stationed at a location within the harbor that allows full monitoring of the area immediately around the piles being driven, as well as a view toward the back of the harbor and toward the harbor entrance. The PSO would scan the waters using binoculars, and/or spotting scopes if necessary, and would use a handheld GPS or range-finder device to verify the distance to each sighting from the project site. All PSOs would be trained in marine mammal identification and behaviors and are required to have no other project-related tasks while conducting monitoring. In addition, monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator. The Port District would adhere to the following observer qualifications:

- (i) Independent observers (*i.e.*, not construction personnel) are required;
- (ii) At least one observer must have prior experience working as an observer;

(iii) Other observers may substitute education (degree in biological science or related field) or training for experience;

(iv) Where a team of three or more observers are required, one observer shall be designated as lead observer or monitoring coordinator. The lead observer must have prior experience working as an observer; and

(v) The Port District shall submit observer CVs for approval by NMFS.

Additional standard observer qualifications include:

- Ability to conduct field observations and collect data according to assigned protocols. Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

A draft marine mammal monitoring report would be submitted to NMFS within 90 days after the completion of pile driving and removal and drilling activities. It will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report must include:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (*e.g.*, percent cover, visibility);
- Water conditions (*e.g.*, sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Locations of all marine mammal observations; and
- Other human activity in the area.

If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA (if issued), such as an injury, serious injury or mortality, The Port District would immediately cease the specified activities and report the incident to the Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator. The report would include the following information:

- Description of the incident;
- Environmental conditions (*e.g.*, Beaufort sea state, visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;

- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities would not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with the Port District to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The Port District would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that the Port District discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (*e.g.*, in less than a moderate state of decomposition as described in the next paragraph), the Port District would immediately report the incident to the Office of Protected Resources, NMFS, and the NMFS West Coast Stranding Hotline and/or by email to the West Coast Regional Stranding Coordinator. The report would include the same information identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with the Port District to determine whether modifications in the activities are appropriate.

In the event that the Port District discovers an injured or dead marine mammal and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the Port District would report the incident to the Office of Protected Resources, NMFS, and the NMFS West Coast Stranding Hotline and/or by email to the West Coast Regional Stranding Coordinator, within 24 hours of the discovery. The Port District

would provide photographs, video footage (if available), or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

### **Negligible Impact Analysis and Determination**

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS’s implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

Pile driving and removal activities associated with the seawall replacement project as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level A harassment and Level B harassment from underwater sounds generated from pile installation and removal. Potential takes

could occur if individuals of these species are present in the ensonified zone when these activities are underway.

The takes from Level A and Level B harassment would be due to potential behavioral disturbance, TTS, and PTS. No mortality is anticipated given the nature of the activity and measures designed to minimize the possibility of injury to marine mammals. Level A harassment is only anticipated for harbor seals. The potential for harassment is minimized through the construction method and implementation of the planned mitigation measures (see *Proposed Mitigation* section above).

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff 2006; HDR, Inc. 2012; Lerma 2014; ABR 2016). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. The pile driving activities analyzed here are similar to, or less impactful than, numerous other construction activities conducted in northern California, which have taken place with no known long-term adverse consequences from behavioral harassment. Level B harassment will be reduced to the level of least practicable adverse impact through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the area while the activity is occurring. While vibratory driving associated with the proposed project may produce sound at distances of several kilometers from the project site through the mouth of the harbor, thus intruding on some habitat, the project site itself is located in a busy harbor and the majority



of sound fields produced by the specified activities are contained within the harbor. Therefore, we expect that animals annoyed by project sound would simply avoid the area and use more-preferred habitats.

In addition to the expected effects resulting from authorized Level B harassment, we anticipate that harbor seals may sustain some limited Level A harassment in the form of auditory injury. However, animals in these locations that experience PTS would likely only receive slight PTS, *i.e.* minor degradation of hearing capabilities within regions of hearing that align most completely with the energy produced by pile driving, *i.e.* the low-frequency region below 2 kHz, not severe hearing impairment or impairment in the regions of greatest hearing sensitivity. If hearing impairment occurs, it is most likely that the affected animal would lose a few decibels in its hearing sensitivity, which in most cases is not likely to meaningfully affect its ability to forage and communicate with conspecifics. As described above, we expect that marine mammals would be likely to move away from a sound source that represents an aversive stimulus, especially at levels that would be expected to result in PTS, given sufficient notice through use of soft start.

The project also is not expected to have significant adverse effects on affected marine mammals' habitat. The project activities would not modify existing marine mammal habitat for a significant amount of time. The activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality is anticipated or authorized;
- The Level A harassment exposures are anticipated to result only in slight PTS, within the lower frequencies associated with pile driving;
- The anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior that would not result in fitness impacts to individuals;
- The specified activity and ensonified area is very small relative to the overall habitat ranges of all species and does not include habitat areas of special significance (BIAs or ESA-designated critical habitat); and
- The presumed efficacy of the proposed mitigation measures in reducing the effects of the specified activity to the level of least practicable adverse impact.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

### **Small Numbers**

As noted above, only small numbers of incidental take may be authorized under Sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate

estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Table 7 presents the number of animals that could be exposed to received noise levels that could cause Level A and Level B harassment for the proposed activities. Our analysis shows that less than 15 percent of each affected stock could be taken by harassment. The numbers of animals proposed to be taken for these stocks would be considered small relative to the relevant stock's abundances even if each estimated taking occurred to a new individual – an unlikely scenario.

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS preliminarily finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

### **Unmitigable Adverse Impact Analysis and Determination**

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

### **Endangered Species Act (ESA)**

No incidental take of ESA-listed species is proposed for authorization or expected to result from this activity. Therefore, NMFS has determined that formal consultation under section 7 of the ESA is not required for this action.

### **Proposed Authorization**

As a result of these preliminary determinations, NMFS proposes to issue an IHA to the Port District for the Aldo's Seawall Replacement Project in Santa Cruz, CA from June 1, 2019 through May 31, 2020, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the IHA itself is available for review in conjunction with this notice at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities>.

### **Request for Public Comments**

We request comment on our analyses, the proposed authorization, and any other aspect of this Notice of Proposed IHA for the proposed pile driving project. We also request comment on the potential for renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform our final decision on the request for MMPA authorization.

On a case-by-case basis, NMFS may issue a second one-year IHA without additional notice when (1) another year of identical or nearly identical activities as described in the Specified Activities section is planned or (2) the activities would not be completed by the time the IHA expires and a second IHA would allow for completion of the activities beyond that described in the Dates and Duration section, provided all of the following conditions are met:

- A request for renewal is received no later than 60 days prior to expiration of the current IHA;

- The request for renewal must include the following:

- (1) An explanation that the activities to be conducted beyond the initial dates either are identical to the previously analyzed activities or include changes so minor (*e.g.*, reduction in pile

size) that the changes do not affect the previous analyses, take estimates, or mitigation and monitoring requirements; and

(2) A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized;

- Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures remain the same and appropriate, and the original findings remain valid.

Dated: April 3, 2019.

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Catherine Marzin,

Acting Director, Office of Protected Resources,

National Marine Fisheries Service.

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